

Electric Circuits with Multiple Loads

Sometimes several electrical loads in a circuit operate at the same time, such as a string of Christmas lights. These loads can be connected two different ways.

LOADS IN SERIES:

Anything connected in **series** has its parts wired to one another in a single path. When loads such as light bulbs are connected in series, there is only one path for the electrons to take.

If a bulb burns out, the others will not light up. The circuit is no longer complete because the filament has broken.

Adding another load in series will increase the **resistance**, which reduces the **current**. The **voltage drop** across each load adds up to that of the energy source.

LOADS IN PARALLEL:

Anything connected in **parallel** has its parts wired together into multiple paths. When loads are connected in parallel, there is a separate path for the electrons to take to each bulb.

If a bulb burns out, the others will still light up. The circuit is still complete because other paths are possible.

Adding another load in parallel will not affect the **resistance**, due to multiple paths. This increases the **current**. The **voltage drop** across each load equals that of the energy source.